

# COGNITIVE ABILITY PROFILES OF JUNIOR HIGH SCHOOL STUDENTS WITH HIGH MATHEMATICAL ABILITIES IN NUMBERS MATERIAL BASED ON TIMSS DOMAIN

## *PROFIL KEMAMPUAN KOGNITIF SISWA SMP BERKEMAMPUAN MATEMATIKA TINGGI PADA MATERI BILANGAN BERDASARKAN DOMAIN TIMSS*

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### Abstract

The study aimed to describe the cognitive ability of junior high school students in answering questions on whole and fraction numbers based on TIMSS domain. This is a descriptive qualitative research involving three junior high school students with high mathematical ability as the subjects, i.e.: KV, DA, and TE. The data collection instruments were TIMSS questions on whole numbers and fraction and the interview guidelines. The data were analyzed by using TIMSS cognitive domain in the sections of knowing, applying and reasoning. The results indicated that the knowing stated in written by KV and in mind by DA. Meanwhile TE's ability was limited to compute fractions and measure. While KV applied mathematical concepts in written, DA and TE applied them verbally. TE was less accurate in using the concept of whole numbers. In the context of reasoning, KV was able to propose various solutions, DA had a single solution to fraction questions, and TE was confined to fraction questions. The subjects made their conclusions only in written.

**Keywords:** TIMSS, cognitive abilities, number

### Abstrak

Tulisan ini bertujuan mendeskripsikan kemampuan kognitif siswa SMP dalam menyelesaikan soal-soal bilangan cacah dan pecahan berdasarkan domain TIMSS. Penelitian kualitatif deskriptif ini mengambil 3 siswa SMP berkemampuan matematika tinggi sebagai subjek penelitian yakni KV, DA dan TE. Instrumen utama adalah peneliti sendiri dibantu soal-soal TIMSS tentang bilangan dan pedoman wawancara. Data dianalisis menggunakan domain kognitif TIMSS pada ranah pengetahuan, penerapan dan penalaran konsep. Hasil penelitian menunjukkan pengetahuan konseptual dinyatakan secara tertulis oleh KV, dalam pikiran oleh DA, sedangkan TE terbatas pada aspek menghitung bilangan pecahan dan pengukuran. KV menerapkan konsep matematis secara tertulis, sedangkan DA dan TE menerapkannya secara lisan. TE kurang teliti dalam penggunaan konsep bilangan cacah. Penalaran konsep menunjukkan KV memiliki beragam penyelesaian, DA memiliki penyelesaian tunggal pada bilangan pecahan dan TE terbatas pada bilangan pecahan. Ketiga subjek membuat kesimpulan hanya secara tertulis.

**Kata Kunci:** TIMSS, kemampuan kognitif, bilangan

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